

# Gaseous Fuel Injection System for Cars, Trucks and Buses

*"GFI Control System's state-of-the-art fuel conversion systems offer a number of potential benefits to Ontario industry, business and motorists, including more efficient use of fuel, lower transportation costs and reduced environmental emissions. Ministry of Environment and Energy support was a critical factor in the GFI technology being completed and manufactured here in Ontario. It helps move Ontario from being a consumer of imported technology to a leading-edge exporter of domestic technology. "*

Lloyd Austin  
President, GFI Control Systems Inc.  
Kitchener, Ontario

## THE COMPANY

Established in 1993, GFI Control Systems Inc. develops and manufactures state-of-the-art electronic computer-controlled fuel systems for natural gas and propane-powered vehicles. The company employs over 100 people and has received ISO 9001 certification. ISO standards are intended to deliver a consistent level of quality in product and service design, development and delivery.

GFI's system is designed to fit passenger cars, trucks, buses and commercial/industrial equipment, either as part of the original vehicle or equipment purchased, or as a retrofit after purchase. The system allows vehicles to operate as a monofuel (using natural gas or propane), or as a bi-fuel operation (using natural gas, propane or gasoline).

Most GFI systems are currently exported to the United States and the United Kingdom. The company also has demonstration programs operating in Italy, Germany, Japan, Korea, Argentina, Mexico and Australia. In 1994, GFI sold over 3,500 GFI systems. Annual sales are expected to increase to 12,000 systems in 1996.

The GFI system is now recognized as the leading North American



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technology. It has achieved QVM (Qualified Vehicle Modifier) status as supplier to Ford Motor Company (USA).

In Canada, where most fuel conversion systems are currently imported, GFI technology has the potential to be a leader.

## THE CHALLENGE

Meeting or exceeding the performance of today's electronic, fuel-injected, highly-reliable gasoline vehicles is the main challenge of natural gas vehicles (NGV), or vehicles fueled by liquified propane gas (LPG).

The vehicle's performance, driveability and emissions have to meet stringent California standards, including 100,000-mile durability tests. Current carburetted NGV or LPG conversions are inferior to current gasoline engines.

Introducing small-volume engine manufacturing – in a market dominated by high-volume, gasoline-vehicle sales – is another key challenge.

## SOLUTION

The Canadian Gas Association and Mississauga-based ORTECH International recognized the large market opportunity for an economic, high-performing, electronic gas-injection system with the capability of providing performance and reliability similar to current gasoline engines.

The benefits to Ontario motorists, business and industry include:

- \* reduced energy consumption;
- \* lower fuel and maintenance costs; and
- \* reduced air pollution because of lower exhaust emissions.

Research and development conducted initially at ORTECH International and, more recently, at GFI Control Systems has focused on the development and improvement of such a gas-injection system.

## RESULTS

With essential funding support from the Ontario Ministry of Environment and Energy and others, the Canadian Gas Association and ORTECH International successfully developed a new computerized natural gas/propane, fuel-injection (GFI) system. The new system makes the conversion of cars and trucks from gasoline-powered to natural gas, or propane, more efficient and clean and can save users 30 to 40 per cent in fuel costs.

Compared with gasoline-engine emissions, the GFI natural gas/propane system produces significantly lower emissions of greenhouse gases and ground-level substances such as ozone.

With its solid-state electronics, the GFI system is at least 50 per cent smaller than any existing mechanical system, making it easy to install in cars, vans, buses and trucks.

It is also completely compatible with modern automotive electronic systems.

The successful development of the GFI system resulted in the creation of Ontario-based GFI Control Systems Inc.

## OPPORTUNITIES

By keeping pace with automobile manufacturers and continuing to invest highly in technology development, GFI is maintaining its leadership position. The company has identified a number of areas of technology development, including emission reduction strategies, to meet new government standards and the emerging market for heavy engines.

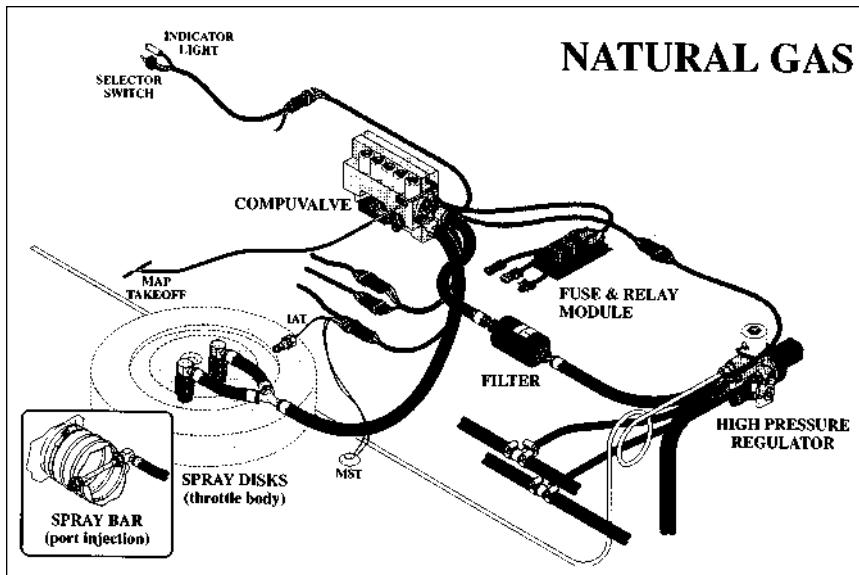


Diagram of GFI natural gas vehicle (NGV) conversion system.

## PARTNERSHIP IN POLLUTION PREVENTION AND RESOURCE CONSERVATION

Industrial companies located in Ontario may seek ministry/industry services that will help them to:

- \* use energy and water more efficiently;
- \* reduce, reuse and recycle solid waste; and
- \* reduce or eliminate liquid effluent and gaseous emissions.

Equipment and services supply companies can benefit from the information provided on technologies identified for business development.

## FOR FURTHER INFORMATION, PLEASE CONTACT:

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## MINISTRY OF ENVIRONMENT AND ENERGY SERVICES

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